

ATTORNEY DOCKET NO.
020533.0197 (2001P20554US)

PATENT APP. SERIAL NO.
09/712,017

IN THE CLAIMS:

Please amend the claims as follows:

1-4. (Cancelled)

5. (Currently Amended) A method of providing automated assistance in configuring customer premises equipment for communication with another network element, comprising:

automatically identifying at least one of a valid virtual channel and a valid protocol for configuration with the customer premises equipment without prompting a user for information that directly or indirectly identifies the at least one of the valid virtual channel and the valid protocol, the valid virtual channel being a communications link; and

assisting the user in configuring the customer premises equipment for use with the identified at least one of the valid virtual channel and the valid protocol;

wherein automatically identifying at least one of a valid virtual channel and a valid protocol for configuration with the customer premises equipment comprises:

communicating over a virtual channel and toward a destination network element a probing configuration signal, the virtual channel being a communication link;

receiving over the virtual channel a response to the configuration signal; and

identifying as valid for configuration the at least one of the valid virtual channel and the valid protocol associated with the response;

wherein communicating the probing configuration signal comprises communicating a plurality of probing configuration signals, each signal associated with a different of the at least one of the valid virtual channel and the valid protocol.

6. (Original) The method of Claim 5, wherein the probing configuration signal comprises an F5 Operations, Administration, and Maintenance loopback signal.

7. (Original) The method of Claim 5, wherein the probing configuration signal comprises a signal having a self configuring protocol.

**ATTORNEY DOCKET NO.
020533.0197 (2001P20554US)**

**PATENT APP. SERIAL NO.
09/712,017**

8. (Original) The method of Claim 7, wherein the probing configuration signal comprises a Dynamic Host Configuration Protocol request, a Link Control Protocol Configuration Packet, or a Point-to-Point Over Ethernet (PPOE) PADI packet.

9. (Currently Amended) The method of Claim 8, wherein the valid protocol comprises an Internet over ATM protocol.

10. (Currently Amended) The method of Claim 8, wherein the valid protocol comprises a Point-to-Point over Asynchronous Transfer Mode protocol or a Point-to-Point over Ethernet protocol.

11. (Original) The method of Claim 5, wherein communicating the probing configuration signal comprises communicating the probing configuration signal over a plurality of virtual channels.

12. (Original) The method of Claim 11, wherein communicating the probing configuration signal over a plurality of virtual channels comprises communicating the signal over a first plurality of virtual channels that are likely to return a response.

13. (Original) The method of Claim 5, wherein communicating the probing configuration signal comprises:

communicating the signal over a first virtual channel; and

communicating the signal over a second virtual channel before a time out value associated with the signal communicated over the first virtual channels expires.

14. (Original) The method of Claim 5, wherein communicating the probing configuration signal comprises:

communicating a first probing communication signal over a virtual channel; and

communicating a second probing configuration signal over the same virtual channel before a time out value associated with the first probing configuration signal expires.

ATTORNEY DOCKET NO.
020533.0197 (2001P20554US)

PATENT APP. SERIAL NO.
09/712,017

15. (Cancelled)

16. (Original) The method of Claim 5, wherein communicating the probing configuration signal comprises communicating a plurality of probing configuration signals approximately simultaneously.

17. (Original) The method of Claim 16, wherein communicating a plurality of probing configuration signals approximately simultaneously comprises:

 spawning a plurality of threads, each thread operable to process signals associated with at least one virtual channel;

 communicating a probing configuration signal over a plurality of virtual channels; and

 monitoring the probing configuration signal associated with each virtual channel using a separate thread.

18. (Original) The method of Claim 16, wherein communicating a plurality of probing configuration signals approximately simultaneously comprises communicating a plurality of probing signals approximately back-to-back over at least one virtual channel.

19-20. (Cancelled)

21. (Currently Amended) A method of providing automated assistance in configuring customer premises equipment for communication with another network element, comprising:

 automatically identifying at least one of a valid virtual channel and a valid protocol for configuration with the customer premises equipment by communicating a first diagnostic signal associated with a first of a plurality of valid virtual channels and the valid protocols toward a destination network element, the valid virtual channel being a communication link; and

 determining connectivity of a network layer based on whether a response to the diagnostic signal is received; and

ATTORNEY DOCKET NO.
020533.0197 (2001P20554US)

PATENT APP. SERIAL NO.
09/712,017

when a response is not received, communicating a second diagnostic signal associated with a second of the plurality of virtual channels and protocols, the virtual channel being a communication link.

22. (Original) The method of Claim 21, wherein the diagnostic signal comprises a Protocol Internet Groper ("PING") signal operable to test an Internet Protocol layer of the network.

23. (Currently Amended) The method of Claim 21, wherein the diagnostic signal comprises a domain name server resolution request signal operable to test a Transmission Protocol layer of the network, the Transmission Protocol layer is a Transmission Control Protocol.

24. (Original) The method of Claim 21, wherein the diagnostic signal comprises a Hypertext Transmission Protocol request signal operable to test an Application layer of the network.

25. (Original) The method of Claim 21, further comprising reporting on the connectivity of a network layer based on whether a response to the diagnostic signal is received.

26. (Previously Presented) The method of Claim 21, wherein the customer premises equipment comprises a modem.

27-30. (Cancelled)

31. (Currently Amended) A computer readable medium operable to execute the following steps on a processor of a computer:

automatically identifying at least one of a valid virtual channel and a valid protocol for configuration with the customer premises equipment by

**ATTORNEY DOCKET NO.
020533.0197 (2001P20554US)**

**PATENT APP. SERIAL NO.
09/712,017**

communicating over a plurality of virtual channels and toward a destination network element a probing configuration signal, the virtual channel being a communication link;

receiving over a valid virtual channel a response to the configuration signal, the valid virtual channel being a communication link; and

identifying as valid for configuration the at least one of the valid virtual channel and the valid protocol associated with the response.

32. (Original) The computer readable medium of Claim 31, wherein the probing configuration signal comprises an F5 Operations, Administration, and Maintenance loopback signal.

33. (Original) The computer readable medium of Claim 31, wherein the probing configuration signal comprises a signal having a self configuring protocol.

34. (Cancelled)

35. (Original) The computer readable medium of Claim 31, wherein communicating the probing configuration signal over a plurality of virtual channels comprises communicating the signal over plurality of virtual channels likely to return a response.

36. (Original) The computer readable medium of Claim 31, wherein communicating the probing configuration signal comprises:

communicating the signal over a first virtual channel; and

communicating the signal over a second virtual channel before a time out value associated with the signal communicated over the first virtual channels expires.

37. (Original) The computer readable medium of Claim 31, wherein communicating the probing configuration signal comprises:

communicating a first probing communication signal over a virtual channel; and

**ATTORNEY DOCKET NO.
020533.0197 (2001P20554US)**

**PATENT APP. SERIAL NO.
09/712,017**

communicating a second probing configuration signal over the same virtual channel before a time out value associated with the first probing configuration signal expires.

38. (Original) The computer readable medium of Claim 31, wherein communicating the probing configuration signal comprises communicating over a virtual channel a plurality of probing configuration signals, each signal associated with a different protocol.

39. (Original) The computer readable medium of Claim 31, wherein communicating the probing configuration signal comprises communicating a plurality of probing configuration signals approximately simultaneously.

40. (Original) The computer readable medium of Claim 39, wherein communicating a plurality of probing configuration signals approximately simultaneously comprises:

spawning a plurality of threads, each thread operable to process signals associated with at least one virtual channel;

communicating a probing configuration signal over a plurality of virtual channels; and

monitoring the probing configuration signal associated with each virtual channel using a separate thread.

41. (Original) The computer readable medium of Claim 39, wherein communicating a plurality of probing configuration signals approximately simultaneously comprises communicating a plurality of probing signals approximately back-to-back over at least one virtual channel.

42.-60. (Cancelled)

61. (Currently Amended) An apparatus operable to provide automated assistance in configuring customer premises equipment, the apparatus comprising:

a configuration manager operable to automatically identify at least one of a valid virtual channel and a valid protocol for configuration with the customer premises equipment without

ATTORNEY DOCKET NO.
020533.0197 (2001P20554US)

PATENT APP. SERIAL NO.
09/712,017

prompting a user for information that directly or indirectly identifies the at least one of the valid virtual channel and the valid protocol, the valid virtual channel being a communication link; and

a memory accessible to the configuration manager and operable to store an identifier of the at least one of the valid virtual channel and the valid protocol based on a response to a probing configuration signal; and

wherein the configuration manager comprises a configurator operable to initiate communication of the probing configuration signal over a virtual channel and toward a destination network element, to receive a response to the configuration signal, and to identify as valid for configuration the at least one of the valid virtual channel and the valid protocol associated with the response, the virtual channel being a communication link; and

wherein the configurator is operable to communicate over a virtual channel a packet comprising a plurality of probing configuration signals, each signal associated with a different protocol.

62.-67. (Cancelled)

68. (Currently Amended) A method of providing automated assistance in configuring customer premises equipment, comprising:

communicating over a virtual channel and toward a destination network element a probing configuration signal, the virtual channel being a communication link, the probing signal operable to identify at least one of a valid virtual channel and a valid protocol without retrieving an identification of the at least one of the valid virtual channel and the valid protocol from a memory storing that information, the valid virtual channel being a communication link;

receiving over the virtual channel a response to the configuration signal; and

identifying as valid for configuration the at least one of the virtual channel and the valid protocol associated with the response;

wherein communicating the probing configuration signal comprises communicating the probing configuration signal over a plurality of virtual channels approximately simultaneously.

**ATTORNEY DOCKET NO.
020533.0197 (2001P20554US)**

**PATENT APP. SERIAL NO.
09/712,017**

69. (Original) The method of Claim 68, wherein the probing configuration signal comprises a signal selected from the group consisting of an F5 Operations, Administration, and Maintenance loopback signal, a Dynamic Host Configuration Protocol request, a Link Control Protocol Configuration Packet, or a Point-to-Point Over Ethernet (PPOE) PADI packet.

70. (Cancelled)

71. (Currently Amended) The method of Claim 68, wherein communicating a plurality of probing configuration signals approximately simultaneously comprises:

 spawning a plurality of threads, each thread operable to process signals associated with at least one virtual channel;

 communicating a probing configuration signal over a plurality of virtual channels; and

 monitoring the probing configuration signal associated with each virtual channel using a separate thread.

72. (Currently Amended) The method of Claim 68, wherein communicating a plurality of probing configuration signals approximately simultaneously comprises communicating a plurality of probing signals approximately back-to-back over at least one virtual channel.

73. (Original) The method of Claim 68, wherein communicating the probing configuration signal comprises:

 communicating the signal over a first virtual channel; and

 communicating the signal over a second virtual channel before a time out value associated with the signal communicated over the first virtual channels expires.

74. (Original) The method of Claim 68, wherein communicating the probing configuration signal comprises:

 communicating a first probing communication signal over a virtual channel; and

**ATTORNEY DOCKET NO.
020533.0197 (2001P20554US)**

**PATENT APP. SERIAL NO.
09/712,017**

communicating a second probing configuration signal over the same virtual channel before a time out value associated with the first probing configuration signal expires.

75. (Previously Presented) The method of Claim 68, further comprising:
displaying the at least one of the valid virtual channel and the valid protocol to a user;
receiving the user's selection of the at least one of the valid virtual channel and the valid protocol; and
configuring the customer premises equipment for operation using the selected at least one of the valid virtual channel and the valid protocol.

76. (Previously Presented) The method of Claim 68, further comprising automatically configuring the customer premises equipment for operation using the at least one of the valid virtual channel and the valid protocol.

77. (Original) The method of Claim 68, further comprising:
communicating a diagnostic signal toward a destination network element; and
determining connectivity of a network layer based on whether a response to the diagnostic signal is received.

78. (Original) The method of Claim 77, wherein the diagnostic signal comprises a signal selected from the group consisting of a Protocol Internet Groper ("PING") signal, a domain name server resolution request signal, and a Hypertext Transmission Protocol request signal.

79. (Original) The method of Claim 77, further comprising reporting on the connectivity of a network layer based on whether a response to the diagnostic signal is received.

80.-82. (Cancelled)